

## STUDIES IN AUSTRALIAN TABANIDÆ

BY

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The following paper is the result of an examination of the Tabanidæ in the Australian Museum, Sydney, which comprises one hundred and twelve specimens representing forty-six species and four varieties referable to seven genera.

Twelve species and four varieties are described as new, while the males of *Erephopsis cinerea*, Ricardo, *Diatomineura pulchra*, Ricardo, and *Tabanus postponens*, Walker, are also described for the first time. Notes on previously known forms are added where necessary.

The new species are distributed in the following genera:—*Erephopsis* (two and one var.), *Diatomineura* (three), *Pelecorhynchus* (two), *Silvius* (one), *Ectenopsis* (one var.) and *Tabanus* (four and two vars.).

One synonym is noted and one name is changed, on the grounds of priority, though they have no connection with the material under review.

The type specimens are in the Australian Museum. One paratype is in the Institute Collection.

This paper brings the number of known Australian Tabanidæ to one hundred and eighty-eight species and five varieties, which are distributed in fifteen genera.

I wish to thank the Trustees and Mr. R. Etheridge, Junr., Director and Curator, of the Australian Museum, for giving me the opportunity to study these forms.

### Sub-family PANGONINÆ.

#### PELECORHYNCHUS DISTINCTUS, *sp. nov.*

♀. Length, 14; width of head, 4.5; length of wing, 13.2 mm.

A handsome well-marked species easily identified by its warm black thorax with lateral yellowish-brown stripes; thorax bright orange-rufous with a median black stripe. Legs reddish-yellow, tarsi paler. Wings with dusky brown and orange spots.

*Head*.—Face and cheeks buff, the former very convex, with a short median dark stripe, an almost quadrate brown blotch beneath the stripe and with a larger nude reddish-brown patch on either side of the apex of the middle third, grooves separating face and cheeks deep; pubescence long, mixed black and white, the latter more numerous basally; beard white, dense; front buff, ocellar triangle and base of antennæ dusky brown, pubescence on ocellar triangle black, long; first joint of antennæ black, with long brownish pubescence, second joint yellowish, third joint bright orange-rufous; palpi pale reddish-yellow, second joint with long white pubescence; eyes black, bare; proboscis dark brown.

*Thorax*.—Warm black with a sub-median and lateral pale yellow ochre stripe on each side, the former continued to posterior margin of the scutellum; pubescence black, pale on the sides, white beneath the shoulders, beneath and behind the wing roots; scutellum warm black in the centre, pale yellow-ochre elsewhere, posterior pubescence white on the sides, brownish in the middle; pleuræ black with grey pubescence.

*Abdomen*.—Orange-rufous with a median black stripe extending to the middle of the penultimate segment, lateral margins widely reddish-brown, dark brown on the first segment; venter dark reddish-brown, lateral pubescence white, long.

*Legs*.—Femora and tibiae reddish-yellow, tarsi warm buff; pubescence reddish-yellow, paler on the tarsi.

*Wings*.—Dusky brown with the upper half deeper hued, the apex of the radial, the cubital cell and portion of the apex of the apical cell clear, with clear patches in the first, second, fourth and fifth posterior cells, the discoidal, anal and the auxiliary cells, with an orange spot reaching from the costa through the subcostal into the cubital cell; veins brown; no appendix present; halteres dark brown.

*Obs*.—Described from two specimens. This species belongs to the *fulvus-mirabilis* group of *Pelecorhynchus*, but may be readily separated from *P. mirabilis*, Taylor, by its different facial and thoracic markings and the color of the legs. It may be distinguished from *P. fulvus*, Ricardo, by the russet colored thorax, abdomen and wings, and by the black legs with yellow tarsi.

*Hab*.—Dorrigo, New South Wales. (Collector and donor.—R. J. Tillyard).

*PELECORHYNCHUS TILLYARDI, sp. nov.*

♀. Length, 16.5; width of head, 5; length of wing, 13 mm.

A striking species owing to its black color. First and second joints and base of third joint of the antennae black; the next four annuli warm-buff, and remaining annuli black. Wings black. First and second abdominal segments with dense white pubescence.

*Head*.—Face, cheeks and front black with grey tomentum, pubescence black; beard black; groove between face and cheeks deep; palpi black, pubescence black, long; antennae with the first two joints and base of third black, next four annuli warm buff, remaining annuli black; pubescence on the first two joints black, scanty; ocelli prominent.

*Thorax*.—Black with two broad median grey stripes terminating at the posterior margin of the thorax with a short wedge-shaped black stripe in each grey one from the posterior margin of thorax and a narrow black stripe separating the grey ones; pubescence black, lateral pubescence long and a tuft of white hairs behind the wing roots; pleurae black with black pubescence.

*Abdomen*.—Black, first segment with dense white pubescence, except in the centre, where it is black, second segment with a basal lateral triangular patch of white pubescence, remaining segments shining black, pubescence black, fairly long on sides of fourth segment; venter black with black pubescence.

*Legs*.—Black, pubescence black, fairly long on the femora.

*Wings*.—Black, veins black, all cells open, no appendix.

*Obs*.—Described from a single specimen which is abundantly distinct from all other known species of *Pelecorhynchus* on account of its general colour. It affords me great pleasure to dedicate this handsome species to its discoverer.

*Hab*.—Dorrigo, New South Wales. (Collector and donor.—R. J. Tillyard)

*PELECORHYNCHUS FUSCONIGER, Walker.*

List. Dipt., i. (1848), p. 192 [? Silvius] et. v., Suppl. l. (1854), p. 267, [Dasybasis]; Ricardo, Ann. Mag. Nat. Hist. (8), v. (1910), p. 407.

*Hab.*—Woodford, New South Wales.

*PELECORHYNCHUS NIGRIPEXNIS, Ricardo.*

Ann. Mag. Nat. Hist. (8), v. (1910), p. 405.

*Obs.*—This appears to be a widely distributed species being found from Southern Queensland to Tasmania.

*Hab.*—Ebor, New South Wales. (Collector and donor.—R. J. Tillyard); Stradbroke Island, Queensland. (Collector.—J. C. Bridwell).

*EREPHOPSIS CINEREA, Ricardo.*

Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 26.

♂. Length, 11; width of head, 4.5; length of wing, 10; proboscis, 4 mm.

Lower third of eyes with small facets; antennæ blackish-brown, first two joints with long black hairs; palpi black with second joint slightly longer than the first, ending in a blunt point, pubescence black, a dirty white at base of first joint.

*Thorax.*—Lateral borders with long black pubescence, and long white hairs from wing roots to scutellum.

*Abdomen.*—First segment clothed with grey pubescence, sides of second to sixth segments with apical grey pubescence.

*Obs.*—A very distinct species, the long stem of the first posterior cell and the large stigma being very distinctive.

*Hab.*—King George Sound, Western Australia. (Collector.—G. Masters).

*EREPHOPSIS NEOTRICOLOR, sp. nov.*

♀. Length, 10.5-11; width of head, 4; length of wing, 10.5; proboscis, 5.5-6 mm.

A small species with black thorax, brown abdomen with median stripe; the cross-veins shaded brown and with brown legs.

*Head.*—Face convex, reddish-brown, cheeks darker with grey tomentum, pubescence black; front black, tomentum ashen, vertex about half as wide as base, pubescence black, no frontal callus; eyes covered with dense pale pubescence; antennæ red, first two joints paler than third with long black pubescence, apex of third black; palpi red, second joint concave and longer than first, pubescence black; beard dense, creamy-white; proboscis long, black.

*Thorax.*—Black, clothed with mixed, erect black and scattered appressed golden hairs, lateral borders with long black and cream colored hairs and pale ones behind the wing roots; scutellum similar to thorax; pleuræ black, covered with pale pubescence.

*Abdomen.*—Reddish-brown, the fourth to the apical segments blackish, segmentations pale, segments one to three with median square black spots not reaching the posterior borders, all segments with traces of median pale apical hairs, pubescence black, golden on the segmentations and at the sides; venter reddish-brown, pubescence yellowish.

*Legs*.—Coxæ black with long pale pubescence, femora and tibiæ reddish-brown, tarsi darker, pubescence black.

*Wings*.—All the cross-veins shaded brown, the cells on the inner half of the wing mainly clear, rest slightly tinged with brown; stigma yellow; a small appendix present; the first posterior cell closed a short distance from the border.

*Obs*.—A small species closely related to *E. tricolor*, Walker, but may be separated from it by its different front, abdomen and wings. It is also close to *E. doddii*, Ricardo, but differs in the thorax, legs and wings.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*EREPHOPSIS GEMINA, Walker.*

List. Dipt., i. (1848), p. 138; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 24.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*EREPHOPSIS GIBBULA, Walker.*

List. Dipt., i. (1848), p. 140; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 22.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*EREPHOPSIS SUBMACULA, Walker.*

List. Dipt., i. (1848), p. 142; Ricardo, Ann. Mag. Nat. Hist. (7), v. (1900), p. 115.

Represented by a single specimen, which agrees fairly well with Ricardo's description. The face lacks the black square mark above the palpi; the first three abdominal segments have lateral white pubescence, very pronounced on the first and reduced to a small patch on the third; venter with interrupted white bands on the second to fourth segments.

*Hab*.—Western Australia.

*EREPHOPSIS MACULIPENNIS, Macquart.*

Dipt. Exot., Suppl. iv. (1849), p. 20; Ricardo, Ann. Mag. Nat. Hist. (8), xix. (1917), p. 209.

A ♂ specimen labelled as above shows some discrepancies both from the original and Miss Ricardo's descriptions in as much as the black spots on the abdomen, which is entirely testaceous, are absent, as is also the appendix on the wing. First two joints of the antennæ red-brown, the third reddish-yellow, apex darker. The beard is tawny.

*Hab*.—South Australia.

*EREPHOPSIS LASIOPHTHALMA, Boisduval.*

Voy. "Astrolabe," Zool. ii. (1832), p. 666, [Pangonia]; Ricardo, Ann. Mag. Nat. Hist. (8), xix. (1917), p. 210.

*Obs*.—Four specimens agree very well with Miss Ricardo's description of this species. They show that the narrowing of the first posterior cell at the border is a variable character—one specimen has it barely closed

on one wing, on the other wing the first posterior cell has a distinct petiole. Another specimen shows a distinct petiole to the first posterior cell on both wings.

*Hab.*—Moonbar and Jindabyne, New South Wales. (Collector.—R. Helms).

*EREPHOPSIS VICINA, sp. nov.*

♂. Length, 14; width of head, 5.5; length of wing, 14; proboscis, 5 mm.

A species with clear wings; thorax with five grey stripes; abdomen mainly reddish-brown with black spots in the middle of the second and third segments and lateral golden pubescence on the thorax and abdomen; legs reddish-brown.

*Head.*—Face and cheeks covered with grey tomentum and long grey hairs mixed with scattered black ones; beard orange; first joint of antennæ swollen, long, black, base red-brown, second joint dark red-brown, base of third red-brown, annuli black, pubescence on first two joints black, long and dense; palpi black, second segment considerably longer than first, tapering to a blunt point, apex reddish, pubescence creamy-white, dense; proboscis black; eyes covered with dense black pubescence.

*Thorax.*—Black, reddish-brown above wing roots, with three grey stripes on the anterior half and one on either side above the wing roots on the posterior half; pubescence on lateral borders black on the anterior half and a dense row of orange hairs beneath the black ones the whole length of the thorax, there is a tuft of grey hairs behind the wing roots; scutellum black; pubescence black; pleura with grey tomentum and pubescence.

*Abdomen.*—First segment black, sides red-brown, second red-brown with an apical lateral patch, third black with red-brown flecks, fourth and fifth black, segmentations red-brown; second segment with a median black spot, segments one to three with traces of orange hairs medially, lateral pubescence orange; venter black, segmentations red-brown, pubescence grey and black, that on segmentations pale, yellowish towards apex.

*Legs.*—Coxæ blackish with grey pubescence; femora, tibiæ and tarsi red-brown, pubescence black, grey on upper surface of femora.

*Wings.*—Clear, basal half of fore border and base yellowish, cross-veins at base of third vein and discal cell tinged brown; veins dark brown, stigma yellow; no appendix.

*Obs.*—A species most nearly related to *E. aureohirta*, Ricardo, but differs in the color of the antennæ, palpi and legs, and the ornamentation of the thorax and abdomen.

*Hab.*—Wentworth Falls, New South Wales. (Collector and donor.—A. Musgrave).

Var. *GEORGI, var. nov.*

♀. Similar to the type but the beard is yellow instead of orange; the lateral fringe of orange hairs on the thorax and abdomen is replaced by yellow ones, with black ones above on the abdominal segments, longest on the third and fourth segments.



The front is about one third broader anteriorly than at vertex and black with black pubescence; first two joints of antennæ dusky-brown, rest red-brown; palpi black, second joint red-brown above, concave, ending in a fine point; basal half of femora black. The spot on the wing is also more prominent.

*Obs.*—The above differences, in the absence of fresh material, do not, to my mind, warrant the variety being raised to specific rank.

*Hab.*—King George Sound, Western Australia. (Collector.—G. Masters).

*EREPHOPSIS JACKSONI*, Macquart.

Dipt. Exot., i. (1838), p. 102; Ricardo, Ann. Mag. Nat. Hist. (7), v. (1900), p. 117.

*Obs.*—Two specimens before me may probably belong to this species. One specimen bears label "*Erephopsis ?jacksoni*, Mcq." in Miss Ricardo's handwriting.

The Queensland specimen is somewhat abraded, but I am unable to separate it specifically from the Western Australian form.

*Hab.*—King George Sound, Western Australia. (Collector.—G. Masters); Queensland.

*DIATOMINEURA JACKSONENSIS*, Guérin.

Voy. de la "Coquille," ii., pt. 2 (1830), p. 289; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 27.

*Obs.*—A specimen in the collection agrees too closely with the description of this species to separate it specifically in the absence of more numerous material.

*Hab.*—South Australia.

*DIATOMINEURA GAGATINA*, Bigot.

Mém. Soc. Zool. Fr., v. (1892), p. 620; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 33.

*Obs.*—I identify three specimens as the above species which agree in all essentials with Miss Ricardo's description. There is a prominent tuft of orange-colored hair beneath the wing roots of which no mention is made in the descriptions.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters); Magnetic Island, Cleveland Bay, Queensland. (Collector.—F. H. Taylor).

*DIATOMINEURA CYDISTER*, sp. nov.

♂. Length, 11.5-12; width of head, 4; length of wing, 9.5 mm.

A small handsome blackish species with reddish-yellow markings on the abdomen; antennæ, palpi and thorax black; legs black and reddish-brown; wings shaded brown on fore border; abdomen dark chocolate brown.

*Head.*—Face, and cheeks black, pubescence black and cream colored, the former mainly on the cheeks; beard cream-colored; antennæ black, first two segments with grey tomentum and black pubescence, base of third oblong, its sides parallel, its base reddish-brown; palpi black, with long black pubescence; eyes black, pubescence black.

*Thorax*.—Black with indications of two submedian grey stripes, one on either side, lateral borders with black pubescence, pale behind the wings; pleuræ black, tomentum and pubescence grey; scutellum dark chocolate brown.

*Abdomen*.—Dark chocolate brown, pubescence dark, pale on the segmentations, all the segments with reddish-yellow, lateral, posterior blotches, with pale pubescence, smallest on the last three segments; venter reddish-brown, pubescence pale.

*Legs*.—Coxæ, femora and tarsi black, basal half of tibiæ reddish-brown, rest black; pubescence on coxæ and femora above at base pale, elsewhere black.

*Wings*.—Grey, veins on fore half and cross-veins at base of discal cell shaded brown, except anterior branch of third vein; first posterior cell widely open at border; no appendix; stigma brown; halteres black.

*Obs*.—A very distinct and striking species on account of its abdominal ornamentation. One of the two specimens bears a label by Miss Ricardo "*Diatomineura* sp., near *gemella*, Wek."

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*DIATOMINEURA PULCHRA, Ricardo.*

Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 35.

♂. Length, 9.5; width of head, 3.5 (vix); length of wing, 9; proboscis, 2 mm.

*Head*.—Face and cheeks covered with yellow tomentum and mainly black with scattered yellow pubescence; face with a deep median furrow, the groove deep between the face and cheeks; palpi orange-yellow, first joint short, swollen, less than half the length of the second which ends in a blunt point; pubescence scanty, yellowish; first two joints of antennæ with yellow tomentum and black pubescence; pubescence on eyes pale on the sides, dark elsewhere.

*Thorax*.—Similar to that of the female.

*Abdomen*.—Similar to ♀, but the golden-yellow haired stripe is also present on the first two and fifth segments in addition to the third, fourth and sixth segments.

*Legs*.—Reddish-yellow, tarsi darker, femora appear yellow in some lights; pubescence black.

*Wings*.—Greyish, first posterior cell not narrowed at the border.

*Obs*.—This specimen is labelled by Miss Ricardo as "perhaps the undescribed ♂ of *D. pulchra*, Ric." It is so similar in appearance to the ♀ that I describe it as such.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*DIATOMINEURA BREVIROSTRIS, Macquart.*

Dipt. Exot., Suppl. iv. (1842), p. 326; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 28.

*Obs*.—The South Australian specimens were identified by Miss Ricardo—the Long Flat specimens are identical.

*Hab*.—South Australia. Long Flat, Hastings River, New South Wales; (Collector and donor.—A. R. McCulloch).

*DIATOMINEURA REGIS-GEORGII, sp. nov.*

♀. Length, 9.5-10; width of head, 3.25-3.5; length of wing, 9.5-10; proboscis, 4.5 mm.

*Head*.—Face convex, creamy, pubescence creamy; cheeks greyish, tinged creamy, pubescence creamy; groove between face and cheeks deep; front about twice as wide anteriorly, tomentum grey-brown, pubescence dark; no frontal callus; pubescence on eyes dark, pale on outer margin; first two joints of antennæ pale reddish-yellow, pubescence black, third joint red; palpi deep yellow, upper margin of second joint concave, reddish, pubescence black; proboscis black, long; beard grey, dense.

*Thorax*.—Black, tomentum grey, pubescence golden, lateral black, a tuft of grey pubescence beneath and behind the wing roots; scutellum black, posterior border with long golden pubescence; plennæ black, tomentum and pubescence grey.

*Abdomen*.—The centre of the first and second segments and the posterior border black, remainder yellowish-brown, remaining segments black, posterior segmentations yellowish-brown; pubescence black, golden on the segmentations; venter yellowish-brown, flecked with black, pubescence pale.

*Legs*.—Coxæ, femora, and tibiæ yellowish-brown, tarsi darker, coxæ with pale pubescence, that on femora pale above and black beneath, tibiæ and tarsi with black pubescence.

*Wings*.—Clear, veins yellowish-brown; stigma inconspicuous; first posterior cell slightly narrowed at the border. Halteres pale.

*Obs*.—Described from two almost perfect specimens and unlike any other *Diatomineura* known to me and does not fit the descriptions of other species. It is somewhat similar in build to *Erephopsis gibbula*, Walker.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*DIATOMINEURA BICOLORATA, sp. nov.*

♂. Length, 11, ♀ 11; width of head, ♂ 4, ♀ 4 (vix); length of wing, ♂ and ♀, 10.75; proboscis, ♂ 5, ♀ 4.75 mm.

A small compact species. Antennæ and palpi reddish-yellow; thorax black; abdomen yellowish-red; apical segments black; legs reddish-brown; wings with cross-veins shaded.

♂. *Head*.—Face reddish-yellow, convex, pubescence black and pale, dense; cheeks with grey tomentum and dark pubescence, groove between cheeks and face shallow; first two joints of antennæ pale reddish-yellow with long black pubescence, third joint red, apex black; palpi yellowish-brown, first joint short, swollen, second joint tapering to a fine point, pubescence at apex black, elsewhere yellow; beard yellowish, dense; eyes densely pubescent.

*Thorax*.—Black, reddish above the wing roots, tomentum brown, pubescence yellow and black, dense; lateral borders with black pubescence, orange above the wing roots; scutellum similar to thorax; plennæ with grey-brown tomentum and grey pubescence, orange colored beneath the wings.

*Abdomen*.—First three segments yellowish-red, third flecked with black, remaining segments black, segmentations yellowish-red, second and third segments with median, oblong, dark brown plugs, pubescence black,



lateral pubescence on first three segments orange mixed with black, black on fourth, cream colored on remaining segments; venter with basal portion pale yellowish with a median, narrow, black stripe, rest black, pubescence mixed pale and black.

*Legs*.—Reddish-brown, coxæ and tarsi darker, pubescence black, very long on under surface of femora.

*Wings*.—Posterior half shaded yellowish-brown; cross-veins at the apex and base of the discal cell and the base of the anterior branch of the third long vein shaded brown, rest of wing grey; stigma pale, inconspicuous; appendix rudimentary.

♀. Similar to the ♂. First joint of the palpi hidden by pubescence, second reddish-yellow, concave on upper margin, ending in an obtuse point. Front black, tomentum ash-grey, pubescence black, vertex about half the width of the base, no callus present.

*Obs*.—A species related to *D. regis-georgii*, Mihi, but distinguished from it by the shaded posterior border and cross-veins of the wings and the different abdomen. The clothing on the pleuræ of the thorax is also brighter.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*DIATOMINEURA PLANA*, Walker.

List. Dipt., i. (1848), p. 144; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 32.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

*DIATOMINEURA TESTACEA*, Macquart.

Dipt. Exot., i. (1838), p. 103; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 31.

*Hab*.—South Australia.

*DIATOMINEURA CONSTANS*, Walker.

Dipt. Saund., i. (1850), p. 15; Ricardo, Ann. Mag. Nat. Hist. (8), xix. (1917), p. 208.

*Hab*.—Tasmania.

*DIATOMINEURA INFLATA*, Ricardo.

Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 34.

*Hab*.—Hastings River, (Collector and donor.—A. R. McCulloch); Coomeroo, New South Wales.

Mr. Tillyard has also taken this species at Kendall, New South Wales.

*CORIZONEURA CHRYSOPHILA*, Walker.

List. Dipt., i. (1848), p. 155; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 36.

*Hab*.—Sydney, New South Wales. (Collector and donor.—E. P. Ramsay).

*CORIZONEURA FULVA*, Macquart.

Dipt. Exot. Suppl., iv. (1850), p. 19; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 36.

*Obs*.—One of the specimens is ticketed "Australia."

*Hab*.—Sydney, New South Wales.

*SILVIUS AUSTRALIS, Ricardo.*

Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 263.

*Obs.*—A single specimen contained in the collection does not allow of definite determination on account of its poor state of preservation, but it is almost certainly this species.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters).

*SILVIUS FERGUSONI, Ricardo.*

Ann. Mag. Nat. Hist. (8), xix. (1917), p. 214.

A ♀ specimen contained in the collection does not altogether agree with Miss Ricardo's description in that the eyes are thinly pubescent. The abdomen has median white triangular spots on segments one to four inclusive with faint grey tomentose banding on segments three and four and broad apical lateral spots on segments two to four. The sub-callus also bears a deep median longitudinal groove. The wings are uniformly blackish-brown: a small appendix present. Length, 14 mm.

*Obs.*—It is considered inadvisable to more than make the above note until the specimen has been compared with an authentic specimen of *S. fergusoni*, Ricardo.

*Hab.*—Norton's Basin, Nepean River, New South Wales. (Collector and donor.—A. Musgrave).

*SILVIUS MINOR, sp. nov.*

♂. Length, 10-10.5; width of head, 3-3.5; length of wing, 10 mm.

A small brown species with spotted wings. Thorax, abdomen and legs reddish-yellow.

*Head.*—Face, reddish-yellow, cheeks darker, pubescence black with a few pale scattered hairs; beard grey, scanty; antennæ golden yellow, apical annuli red-brown, second segment about half the length of the first, pubescence black, scanty; first joint of palpi yellowish, very short, swollen, second joint long, slender, ending in a blunt point, about four times the length of the first, pubescence black; eyes bare; ocelli prominent.

*Thorax.*—Black, covered with yellowish-brown tomentum and pale pubescence, lateral borders with pale pubescence; scutellum paler than thorax, posterior border with pale pubescence; pleuræ dark yellowish-brown, pubescence pale.

*Abdomen.*—Uniform dark yellowish-brown, with indistinct grey tomentose bands, pubescence pale; venter similar to dorsum.

*Legs.*—Coxæ reddish-brown; femora, tibiæ and tarsi honey-yellow, pubescence pale.

*Wings.*—Tinged brown, with darker spots at the base and apex of the discoidal and apex of the inferior basal cells, these cells, the anal and the axillary cells almost clear; veins brown; stigma brown, inconspicuous; no appendix present.

*Obs.*—The thorax of the two specimens before me is more or less abraded but sufficient thoracic clothing remains in the type to show its nature. It is a very distinct species and may be separated from *S. doddi*, Ricardo, and *S. lunulatus*, Bigot, by its thorax, abdomen, legs, wings; the palpi are also distinctive.

*Hab.*—South Australia.

*SILVIUS NIGRIPENNIS, Ricardo.**SILVIUS ATER, Taylor.*

Ann. Mag. Nat. Hist. (8), xix. (1917), p. 213; Taylor, Proc. Linn. Soc., N. S. Wales, xli. (1917), p. 751.

*S. nigripennis* takes precedence as it appeared in February whilst *S. ater* was not published until April.

*Hab.*—Claudie River, Queensland. (Collector.—J. A. Kershaw); Brock's Creek and Mary River, Northern Territory. (Collector.—G. F. Hill).

*SILVIUS DODDI, Ricardo.*

Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 261.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters).

*ECTENOPSIS AUSTRALIS, Ricardo.*

Ann. Mag. Nat. Hist. (8), xix. (1917), p. 217.

Length, ♂ 11.5, ♀ 10.5-11; width of head, ♂ 3.5, ♀ 2-2.5; length of wing, ♂ 10, ♀ 10-10.5 mm.

Two ♀ specimens and a ♂ in the collection differ somewhat from the description of this species which is stated to be somewhat variable in the legs.

♂. Abdomen as in description; legs black, except basal half of femora reddish-yellow, *femur, tibiae and first tarsal of the middle right leg pale reddish-yellow*, remaining tarsi dusky; antennæ as described, third joint missing.

♀. Second and third divisions of antennæ raw-sienna; median thoracic stripe uniformly broad, broader than the lateral stripes; no triangular median spots on the second to fourth segments of abdomen; appendix of wing variable in length; legs as in type.

*Obs.*—Judging from the description of this species and the specimens before me this would appear to be a variable species. The differently colored mid right leg in the ♂ is curious as it belongs without doubt to the specimen under review. The dimensions of these specimens is given as they were omitted from the description of the type.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters).

*ECTENOPSIS VULPECLA, Wiedemann.*

Ausszweifl. Ins. i. (1828), p. 195 (Chrysops); Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 266.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters).

*Var. NIGRIPENNIS, var. nov.*

♀. Length, 11; width of head, 3; width of front of vertex, 0.5; length of wing, 9.5 mm.

Palpi black, base raw-sienna, pubescence black, beard very scanty, golden; first and second segments and first two divisions of the third joint of the antennæ reddish-brown, rest black; pubescence black, sparse; wings dusky, veins deep black; stigma black; appendix short. Legs: coxæ raw-sienna, femora, tibiae and tarsi black, pubescence black.

*Obs.*—Represented by a single specimen in the collection. It differs from *E. vulpecula*, Wied., in the above details which do not appear to be sufficient to raise it to specific rank. It is abundantly distinct from *E. australis*, Ricardo.

*Hab.*—Norton's Basin, Nepean River, New South Wales. (Collector.—A. Musgrave).

#### Sub-family TABANINÆ.

Group vii. Abdomen with one or more stripes, usually continuous.

##### TABANUS PARVICALLOSUS, Ricardo.

Ann. Mag. Nat. Hist. (8), xvi. (1914), p. 394.

*Hab.*—Gayndah, Queensland. (Collector.—G. Masters).

Group viii. Species with median or lateral spots, or both, on abdomen, not usually forming a continuous stripe.

##### TABANUS SPOLIATUS, Walker.

Proc. Linn. Soc., iv. (1860), p. 103; Ricardo, Ann. Mag. Nat. Hist. (8), xv. (1915), p. 275.

*Obs.*—The collection contains a single ♂ specimen determined as this species by Miss Ricardo from Victoria (no definite locality being given). It seems remarkable that a species described from Macassar, and the Celebes, being unknown from Northern Australia where its presence might be expected, should be found in Victoria.

*Hab.*—Victoria.

##### TABANUS VICTORIENSIS, Ricardo.

Ann. Mag. Nat. Hist. (8), xv. (1915), p. 275.

*Obs.*—The collection contains two specimens, one of which, determined by Miss Ricardo, is in rather a poor state of preservation, the thorax and abdomen being abraded. The second specimen is clearly this species and is in a good state of preservation.

*Hab.*—Moonbar, (Collector —R. Helms); Blackheath, New South Wales. (Collector and donor.—A. Musgrave).

Group ix. Species with paler bands, and sometimes spots on abdomen.

##### TABANUS MUSGRAVI, *sp. nov.*

♀. Length, 11; width of head, 4; width of front of vertex, 0.25; length of wing, 11 mm.

A small compact black species. Antennæ dark reddish-brown, apices black. Palpi reddish-yellow. Thorax black. Abdomen black with grey bands. Legs blackish.

*Head.*—Face, cheeks and sub-callus grey-black; beard grey, scanty; front black, uniform in width, pubescence black, short and scanty; frontal callus shining black, tumid, pear-shaped, reaching the eyes, with a lineal extension, about as long as the plug, not reaching the vertex; eyes dull black, with copper-colored patches in some lights; antennæ dark reddish-

brown, annuli black, tooth very small on expanded basal portion, pubescence black and scanty on first and second segments; palpi reddish-yellow, pubescence black; proboscis very short, black.

*Thorax*.—Dark grey-black, with short, scanty, mixed dark and pale pubescence, sides with dense, fairly long grey-black hairs; scutellum similar to thorax with some scanty grey pubescence; pleuræ grey-black with fairly long grey hairs.

*Abdomen*.—Dull black, densely clothed with appressed black hairs, segmentations grey with grey pubescence and faint pale creamy median spots on the first four segments, lateral margins of the first six segments grey, diminishing in size toward the apex; venter grey with whitish pubescence, segmentations distinct.

*Legs*.—Black, femora with fairly dense and long grey pubescence, black on tibiæ and tarsi, longest on the tibiæ.

*Wings*.—Grey; veins black; stigma dark yellowish-brown; no appendix.

*Type*.—Unique. It may be distinguished from *T. kershawi*, Ricardo, by its differently colored antennæ, its sub-callus not shiny, the uniform front and the wings. Differs from *T. griseoannulatus*, Taylor, in its larger frontal callus; the first and second joints of the antennæ being uniform in color and the absence of an appendix on the wings.

*Hab*.—Underbank, New South Wales. (Collector and donor.—A. Musgrave, Dec. 1915).

TABANUS MACQUARTI, Ricardo.

Ann. Mag. Nat. Hist. (8), xv. (1915), p. 277.

*Hab*.—South Australia.

Group x. Species with the abdomen unicolorous, or almost so, sometimes darker at the apex.

TABANUS DIMINUTUS, Walker.

List. Dipt., i. (1848), p. 183; Ricardo, Ann. Mag. Nat. Hist. (8), xv. (1915), p. 285.

*Obs*.—There seems little doubt that the specimen before me is referable to this species. There are a few points of disagreement with Miss Ricardo's description of Walker's type, but it is said to be in a poor state of preservation. The third joint of the antennæ is blackish-brown instead of tawny and the frontal callus is a small, almost circular, light brown plug without a lineal extension.

*Hab*.—Gayndah, Queensland. (Collector.—G. Masters).

TABANUS SANGUINARIUS, Bigot.

Mém. Soc. Zool. France, v. (1892), p. 675; Ricardo, Ann. Mag. Nat. Hist. (8), xv. (1915), p. 287.

*Hab*.—South Australia.



Group xi. Species with pubescence on the eyes (*Theriopectes*).

*TABANUS IMPERFECTUS*, Walker.

List. Dipt., i. (1848), p. 179; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 278.

♂. Length, 10; width of head, 3.5; length of wing, 8 mm.

Antennæ, palpi and thorax similar to ♀. Abdomen with a grey basal band on the second segment in addition to the posterior band; tibiæ blackish, first tarsals black. Wings grey; veins and stigma black; appendix present.

*Hab.*—Wedge Bay, Tasmania. (Collector and donor.—G. H. Hardy).

*TABANUS RAINBOWI*, *sp. nov.*

♂. Length, 11.5; width of head, 4; length of wing, 10 mm.

A small species with black thorax. Abdomen orange-rufous with a broad black stripe the whole length gradually tapering to the apex. Legs orange-rufous. Wings faintly yellow.

*Head.*—Face and cheeks black, dark reddish-brown round the base of the antennæ; sub-callus dark reddish-brown; first and second joints of the antennæ reddish-yellow, with dense black pubescence, third joint wanting; palpi light yellowish-brown, second joint swollen and longer than the first, ending in a blunt point; pubescence long and black with a few long grey hairs in addition on the first joint; eyes black, facets small, densely covered with short grey pubescence; beard dense, grey, with scattered black hairs.

*Thorax.*—Black, clothed with long, erect black hairs; sides orange-rufous, with long black pubescence from the wing roots to the apex of the shoulders; scutellum black, pubescence black; pleuræ black with scattered grey hairs.

*Abdomen.*—Orange-rufous; first segment black, apical margin orange-rufous, black in the centre, remaining segments, except the last, with large black median spots gradually tapering in width to the apex and forming a continuous stripe, apical segment orange-rufous; pubescence black, golden on the segmentations, the black hairs are long on the sides; venter orange-rufous, pubescence mixed grey and black.

*Legs.*—Coxæ black, with long black pubescence, basal half of femora black, rest orange-rufous; tibiæ orange-rufous, apices black; fore and mid tibiæ almost wholly black, hind tarsi with the apices black, pubescence black, femora with long grey pubescence beneath.

*Wings.*—Clear; veins yellowish-brown; stigma yellowish; no appendix present.

*Obs.*—Described from a single specimen, most nearly related to *T. hutsalis*, Walker, but may be distinguished by the densely pubescent eyes, the sides of the thorax being orange-rufous, the orange-rufous venter, the legs and the absence of an appendix on the wings.

It affords me much pleasure to associate the name of my friend, Mr. W. J. Rainbow, with this species.

*Hab.*—King George Sound, Western Australia. (Collector.—G. Masters).

*TABANUS CIRCUMDATUS, Walker.*

List. Dipt., i. (1848), p. 181; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 280.

*Obs.*—The West Australian specimens evidently belong to this variable species. When compared with a specimen kindly determined for the writer by Mr. Austen by comparison with the type, the only noticeable differences are that the eyes are more hairy and the legs paler.

*Hab.*—Jindabyne and Moonbar, New South Wales. (Collector.—R. Helms); King George Sound, Western Australia. (Collector.—G. Masters).

*TABANUS VETUSTUS, Walker.*

List. Dipt., i. (1848), p. 179; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 277.

*Hab.*—King George Sound, Western Australia. (Collector.—G. Masters).

*TABANUS ANTECEDENS, Walker.*

List. Dipt., i. (1848), p. 178; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 279.

*Hab.*—Wentworth Falls, New South Wales. (Collector.—A. Musgrave).

*TABANUS EDENTULUS, Macquart.*

Dipt. Exot., Suppl., i. (1846), p. 34; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 281; White, Papers and Proc. Royal Soc. Tasmania (1915), p. 10.

*Hab.*—Hobart, Tasmania. (Collector.—G. H. Hardy).

*TABANUS HOBARTIENSIS, White.*

Papers and Proc. Royal Soc. Tasmania (1915), p. 13.

*Obs.*—Represented by a single specimen which does not very well agree with this species, but till further material is available it is considered better to leave it under the above name.

*Hab.*—Tasmania.

*TABANUS NEOBASALIS, Taylor.*

*Tabanus basalis*, Walker, ♀, List. Dipt., i. (1848), p. 182, *nomen bis lectum*; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 282.

*Obs.*—A change of name becomes necessary for this species as *basalis* was previously used by Macquart<sup>1</sup>.

*TABANUS GENTILIS, Erichson.*

Archiv. f. Naturgesch., viii. (1842), p. 271; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 286.

*Obs.*—The specimen from Barrington Tops has the apex of the anal cell slightly shaded brown, but not the stem. It is quite typical in other respects.

*Hab.*—Barrington Tops, 4,600 ft., New South Wales; (Collector and donor.—A. Musgrave); King George Sound, Western Australia. (Collector.—G. Masters).

<sup>1</sup> Macquart—Dipt. Exot., i. (1) (1838), p. 130, for a different species belonging to Group vi. from East India.

TABANUS PSEUDOBASALIS, *sp. nov.*

♀. Length, 12.25-13; width of head, 4.75-5; length of wing, 10-11 mm.

A small black species with pale antennæ and palpi; thorax black; abdomen yellowish; legs reddish-yellow; wings clear.

*Head*.—Face and cheeks with creamy-yellow tomentum and pale pubescence; front paler with golden pubescence, broader anteriorly, about two and a half times as long as broad, no frontal callus; first two joints of antennæ yellow, pubescence pale, a few black hairs on the apices, third joint bright reddish-yellow, the base with a sharply defined obtuse angle; palpi cream-colored, tapering to a fine point, pubescence pale, first joint with dense creamy pubescence; beard cream-colored; pubescence on eyes very slight.

*Thorax*.—Black with golden pubescence, shoulders yellowish, lateral pubescence pale; scutellum similar to thorax, pubescence on anterior border long; pleuræ pale, flecked with black, pubescence pale.

*Abdomen*.—Yellowish-brown, darker towards apex, pubescence golden, with scattered black hairs towards the apex; venter yellowish-brown, tomentum grey.

*Legs*.—Reddish-yellow, tarsi darker, coxæ with long pale pubescence, short and black elsewhere.

*Wings*.—Clear; veins yellow-brown; stigma yellow; a small appendix present.

*Obs*.—This species is in some respects not unlike *T. basalis*, Walker, but it is distinguished by the golden pubescence on the thorax and abdomen, the cream-colored face, the absence of stripe on the abdomen and there being *no* frontal callus.

*Hab*.—King George Sound, Western Australia. (Collector.—G. Masters).

TABANUS INDEFINITUS, *sp. nov.*

♀. Length, 11-11.5; width of head, 4-4.5; length of wing, 10 mm.

A small black species with reddish antennæ; palpi dusky; thorax black; abdominal pubescence black, segmentations golden; legs black, base of tibiæ yellowish; wings clear.

*Head*.—Face grey, cheeks buff, pubescence grey; beard white; front dark grey, shining black when denuded, pubescence black, vertex black, slightly wider anteriorly; frontal callus shining black, as wide as front, resting on the sub-callus, and with a short broad extension; eyes slightly pubescent; first two joints of antennæ and expanded portion of the third reddish-brown, annuli black, pubescence on first joint pale and black, black on the second, base of third broad, angle small, no tooth; palpi dark, tapering to a fine point, with dense grey pubescence.

*Thorax*.—Black with three brown stripes, tomentum grey, densely clothed with erect black and appressed golden hairs, shoulders pale reddish, with black hairs and dense grey ones beneath; scutellum similar to thorax, posterior border with long golden pubescence.

*Abdomen*.—Black with black pubescence, posterior borders of segments pale with golden pubescence and median, apical, triangular golden spots on segments one to five, segments broadly pale laterally,

second more so than first, and clothed with golden hairs; venter blackish, dark reddish-brown towards the apex, tomentum grey, pubescence pale, golden laterally.

*Legs*.—Femora and tarsi black, basal two thirds of fore and basal third of hind tibiæ pale reddish-yellow, rest black, mid femora, pale reddish-yellow, pubescence black.

*Wings*.—Clear, very faintly clouded yellow on the cross-veins at the base of the discal cell; veins dark brown; stigma yellowish, inconspicuous; a long appendix present; base of wings tinged yellow; halteres dark brown, apices yellow.

*Obs*.—A small but striking species on account of the golden dorsal pubescence. It may be distinguished from *T. antecedens*, Walker, by the thoracic and abdominal ornamentation and the tibiæ. There is also a certain resemblance to *T. oculatus*, Ricardo, in the thoracic clothing but it appears to be distinct.

*Hab*.—Glenbrook Creek and Norton's Basin, Nepean River, New South Wales. (Collector and donor.—A. Musgrave, Oct. 1915).

Two other specimens also from New South Wales—one from Dunedoo, the other from Sydney may possibly belong to this species but differ in some essentials, and may be characterised as follows:—

*Var. A.* Antennæ bright reddish-brown, annuli black; palpi paler than in the type; abdomen reddish-brown, except the first and last three segments blackish, segmentations pale; second segment with a median black spot not reaching the posterior margin and segments two to five with indistinct apical grey triangular spots.

*Hab*.—Dunedoo, New South Wales. (Collector.—W. W. Thorpe, 1/17).

*Var. B.* Antennæ entirely pale reddish-brown; palpi creamy, and the abdomen similar to Var. A. but lacking the apical triangular spots on the abdomen.

*Obs*.—I am disinclined to separate these specimens as distinct species in the absence of more specimens, as they resemble the typical form too closely in shape, color of legs and thorax. The wings are also similar to the type.

*Hab*.—Sydney, New South Wales. (Collector and donor.—A. Musgrave).

#### TABANUS POSTPONENS, Walker.

List. Dipt., i. (1848), p. 179; Ricardo, Ann. Mag. Nat. Hist. (8), xvi. (1915), p. 282.

♂. Length, 13; width of head, 5; length of wing, 12 mm.

*Head*.—Face and cheeks grey-black, tomentum and pubescence grey; beard white; first two joints of antennæ blackish; pubescence black, third wanting; palpi, first joint dark reddish-brown, slender, second joint swollen, pale reddish-yellow, pubescence mixed pale and black; eyes with dense pale pubescence, facets black and brown, the latter occupying the upper two-thirds, except for a narrow border of black ones circling the eyes above.

*Thorax*.—Black, partially denuded, with a few scattered black hairs, sides with long pale ones; scutellum similar, posterior margin with pale hairs; pleuræ black, tomentum grey, pubescence pale.

*Abdomen*.—Reddish-brown, darker toward the apex, the grey tomentose bands narrow with faint indications of median grey triangular spots; venter reddish-brown, segmentations grey.

*Legs*.—Dusky, base of tibiæ reddish.

*Wings*.—Clear; veins and stigma yellowish-brown; a small appendix present.

*Obs*.—Notwithstanding certain discrepancies with the description of this species, which may be sexual, it is considered preferable to place the above specimen under this species. It is the first time the ♂ has been described.

*Hab*.—Gayndah, Queensland. (Collector.—G. Masters).

TABANUS BRISBANENSIS, *Taylor*.

Proc. Linn. Soc. N.S.Wales, xlii. (1917), p. 526.

*Hab*.—Queensland.